

REMARKS

Applicants thank the Examiner for the very thorough consideration given the present application. Claims 1 and 3-16 remain in the application and claims 1, 8, 11 and 16 are independent. Claims 11-15 remain withdrawn from consideration by the Examiner.

The Office Action dated August 6, 2009 has been received and carefully reviewed. Each issue raised in the Office Action is addressed below. Reconsideration and allowance of the present application are respectfully requested in view of the following remarks.

Claim Rejections – 35 U.S.C. § 112, Second Paragraph

Claims 1 and 16 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. This rejection is respectfully traversed.

The Examiner indicates that the terms “the cleaning gas supply unit” and “the post-processing gas supply unit” are not clear to the Examiner as to what structure is claimed or envisioned by such language.

Applicants first respectfully point out that these terms are defined in the claims. For example, the term “cleaning gas supply unit” in claim 1 was defined in the claim as the unit “for supplying cleaning gas which removes accretion adhering to an inner side of said reaction container by subjecting said substrate to the desired processing.” And the term “post-processing gas supply unit” in claim 1 was defined in the claim to include, *inter alia*, the unit “for supplying post-processing gases” and includes in claim 1 “exclusive supply nozzles for independently supplying each of the reaction gases”. It is hard for Applicants to understand how this claimed structure could be unclear, absent any further clarification on the part of the Examiner. MPEP § 2111 clearly directs Examiners to use the broadest reasonable interpretation “consistent with the interpretation that those skilled in the art would reach.”

Second, Applicants also respectfully point out that these claim terms are exactly the same claim terms that were present in the claims as originally filed. And these are the same terms which the Examiner found clear enough in all of the prior seven Office Actions on the merits that no question as to meaning was raised in any of the prior seven Office Actions. A review of the application disclosure as filed reveals these terms were present on at least pages 4, 5, 7, 8 and 9

of the original specification. It is well settled that the claims as filed are part of the specification, and may provide or contribute to compliance with Section 112. See Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 938, 15 USPQ2d 1321, 1326 (Fed. Cir. 1990) (the original claims are part of the patent specification); In re Benno, 768 F.2d 1340, 1346, 226 USPQ 683, 686-87 (Fed. Cir. 1985); In re Frey, 166 F.2d 572, 575, 77 USPQ 116, 119 (CCPA 1948), cited in Hyatt v. Boone, 47 USPQ2d 1128, 1130 (Fed. Cir. 1998). So, Applicants are understandably uncertain as to how language that was previously understandable to the Examiner could now have become not understandable. Should this rejection be maintained, Applicants request a more comprehensive explanation as to what might be indefinite about this language so that Applicants might be better able to respond. Moreover, Applicants respectively point out that MPEP § 2173.03 states in part:

“The examiner's focus during examination of claims for compliance with the requirement for definiteness of **35 U.S.C. 112**, second paragraph, is whether the claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. When the examiner is satisfied that patentable subject matter is disclosed, and it is apparent to the examiner that the claims are directed to such patentable subject matter, he or she should allow claims which define the patentable subject matter with a reasonable degree of particularity and distinctness. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire. Examiners are encouraged to suggest claim language to applicants to improve the clarity or precision of the language used, but should not reject claims or insist on their own preferences if other modes of expression selected by applicants satisfy the statutory requirement.”

Applicants respectfully submit that these phrases particularly point out and distinctly claim the subject matter which Applicants regard as their invention. However, in order to overcome this rejection, Applicants have amended claims 1, 3 and 16 to correct each of the deficiencies specifically pointed out by the Examiner by converting to the terms “a cleaning gas supply system” and “a post-processing gas supply system” as used on page 21 of the original specification, and as subsequently used in lines 7-13 on page 27 of the original specification. These claim terms and phrases “conform to the invention as set forth in the remainder of the specification” and phrases used in the claims “find clear support or antecedent basis in the description so that the meaning of terms in the claims may be ascertainable by reference to the

description” as required by 37 C.F.R. § 1.75(d)(1), and therefore by definition satisfy the requirements of 35 U.S.C. § 112, second paragraph, as to the clarity of the claims. Therefore, Applicants respectfully submit that the claims, as amended, particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Claim Rejections – 35 U.S.C. § 103

Claims 1, 3, 4, 6, 8-10 and 16 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over JP 2002-324760 to Toyoda in view of Saito and U.S. Pub. No. 2003/0070617 to Kim et al. (“Kim”). Applicant submits the Examiner has failed to establish a *prima facie* case of obviousness and respectfully traverses the rejection. A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

In order to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), the cited references must teach or suggest each and every element in the claims. See M.P.E.P. § 706.02(j); M.P.E.P. 2141-2144.

Applicants respectfully submit that this rejection is improper for a number of reasons. First, the base reference to Toyoda is directed to a substrate processing apparatus for film deposition including a reaction container 1 in which process time may be reduced by lowering process temperature by means of the introduction of plasma activated hydrogen for pretreatment cleaning through holes 14 of discharge tube 7 prior to forming a layer of SiGe. Since it is not necessary to raise the hydrogen gas to a temperature higher than the temperature necessary for film deposition, the time for raising and lowering the cleaning process temperature may be avoided. Toyoda only shows a film deposition system in which plasma is limited to discharge tube 7, which controls diffusion of the charged particles from the plasma. This reduces damage to the substrate 2, as described in paragraph [0018] to be deposited with a film of SiGe as described in paragraph [0022]. Toyoda does not discuss post deposition cleaning at all. More specifically, Toyoda does not discuss a cleaning gas supply system for supplying cleaning gas which removes accretion adhering to an inner side of the reaction container by subjecting the substrate to the desired processing, as recited. And Toyoda also does not discuss a post-

processing gas supply system for supplying post processing gases after the cleaning gas is supplied and before the substrate is placed in the container by the controller to independently and alternately supply all of the reaction gases through exclusive supply nozzles. Instead, the base reference to Toyoda has provided no showing or suggestion at all regarding any post film formation cleaning or post-processing cleaning. Thus, the base reference to Toyoda is significantly different than what is claimed and, in no way, discloses or suggests the claimed invention.

Second, the secondary reference to Saito appears to disclose a reaction container 11, an exhaust port 61, a gas supply system 35a, 35b, 35c and 35d for supplying reaction gases to the reaction container and a controller 75 for controlling the gas supply system. The gas supply system includes a cleaning gas supply unit 35d for supplying cleaning gas and the third embodiment, starting with paragraph [0175] describes a post-processing gas supply of nitrogen gas after the cleaning step. Saito fails to show or suggest a controller that controls the post-processing gas supply unit to supply all of the post-processing gases, where all of the post-processing gases include all of the reaction gases supplied alternately. Therefore, the secondary reference to Saito neither discloses nor suggests a controller that controls the post-processing gas supply unit to supply all of the post-processing gases alternately through exclusive supply nozzles, where all of the post-processing gases include all of the reaction gases supplied alternately, as recited in claims 1, 8 and 16. Finally, the Office Action refers to Kim at paragraph [0011] for a valve controller for alternately supplying the reaction gases. But Kim has nothing to do with controlling the application of post-processing gases. In Kim, the controller 30 discussed in paragraph [0011] is merely the conventional controller for the alternate application of process gases during atomic layer deposition. Kim has only a brief disclosure in paragraph [0034] related to supplying a cleaning gas subsequent to the feeding of any of the reactive gases. There is no disclosure in Kim of a controller for controlling a cleaning process and for controlling a post-processing process as in the instant claims. Kim clearly fails to address the specific claimed features of a controller or control apparatus controlling the cleaning gas supply unit and the post-processing gas supply unit, and therefore cannot remedy the deficiencies of Toyoda or Saito.

Accordingly, the Office Action fails to make out a *prima facie* case of obviousness of the subject matter recited in currently pending claims 1, 8 and 16.

With regard to dependent claims 2-4, 6, 9 and 10, Applicants submit that claims 2-4, 6, 9 and 10 depend, either directly or indirectly, from independent claims 1 and 8, respectively, which are allowable for the reasons set forth above, and therefore claims 2-4, 6, 9 and 10 are allowable based on their dependence from claims 1 and 8. Reconsideration and allowance thereof are respectfully requested.

Claim 5 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Toyoda in view of Saito and Kim, and further in view of U.S. Pub. No. 2005/0139578 to Fukuda et al. ("Fukuda"). This rejection is also respectfully traversed. Fukuda was cited to show a "nozzle 22 for supplying a gas containing fluorine (NF₃) tied into the same nozzle which supplies a nitrogen gas via nozzle 5." With all due respect, it is not clear what connection there might be concerning the two cleaning gases NF₃ and Nitrogen, as in Fukuda, and the supply of a cleaning gas containing fluorine and a reaction gas containing silicon, as in claim 5. Fukuda fails to establish the connection between these entirely different issues as to claim 5. Moreover, Fukuda also fails to show or suggest a controller that controls the post-processing gas supply unit to supply all of the post-processing gases alternately through the exclusive supply nozzles, where all of the post-processing gases include all of the reaction gases supplied alternately, and therefore cannot remedy the defects of Toyoda, Saito and Kim as discussed above, the comments of which are incorporated herein. Reconsideration and withdrawal of this rejection are respectfully requested.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Toyoda in view of Saito and Kim, and further in view of Choi. This rejection is also respectfully traversed. Choi was cited to show ClF₃ as the cleaning gas. However, Choi merely uses ClF₃ for cleaning and there is no disclosure of a controller for controlling cleaning and post-processing at all, much less a controller that controls the post-processing gas supply unit to supply all of the post-processing gases alternately through the exclusive supply nozzles, where all of the post-processing gases include all of the reaction gases supplied alternately, and therefore Choi cannot remedy the defects of Toyoda, Saito and Kim as discussed above, the comments of which are

incorporated herein. Reconsideration and withdrawal of this rejection are respectfully requested.

Conclusion

All objections and rejections raised in the Office Action having been properly traversed and addressed, it is respectfully submitted that the present application is in condition for allowance. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Notice of same is earnestly solicited.

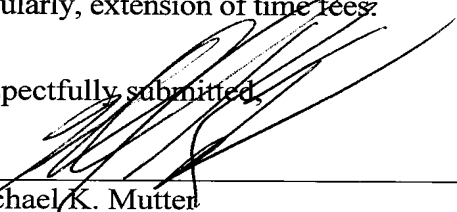
Prompt and favorable consideration of this Amendment is respectfully requested.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Paul T. Sewell, Registration No. 61,784, at (703) 205-8000, in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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